Article

The Influence of Individual Characteristics in Predicting Mobile Commerce Usage Activities' Continuance Intention

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Abstract – There are relatively few prior post-adoption studies that delineate the influence of individual characteristics on mobile commerce usage activities. Due to that, this article aims to examine the continuance intention of mobile commerce usage activities among Malaysian consumers by enhancing the original Expectation-Confirmation Model (ECM) framework. Apart from maintaining the perceived usefulness construct, the research framework was extended by incorporating individual characteristics construct, which comprise three factors, namely personal innovativeness, expertise, and self-efficacy. Data was collected from 632 consumers and analyzed using the Partial Least Squares structural equation modelling technique. Findings revealed that the individual characteristics construct is secondary to satisfaction and a better predictor compared to perceived usefulness in explaining 33.3% of the variance in continuance intention. Among the three individual characteristics' factors, self-efficacy denotes the highest beta value strengths, followed by expertise, and personal innovativeness. Therefore, mobile commerce application developers should focus on designing applications that would satisfy the consumers' expectations as well as take consumers' individual characteristics into consideration owing to the fact that consumers' differences change over time. Gaining a better understanding of consumers' individual characteristics would be valuable and beneficial for the providers of mobile commerce in constructing effective marketing strategies to promote continued use among the consumers.

Keywords: Continuance intention, Expertise, Individual characteristics, Personal innovativeness, Self-efficacy

1. Introduction

The proliferation of the usage of mobile gadgets such as smartphones and tablet computers has made mobile commerce grow at an explosive rate. Mobile commerce is undeniably one of the fastest growing technologies after the birth of the Internet.

Unlike its predecessor which is electronic commerce, consumers all over the world are no longer restricted to geographical constraints in order to engage in mobile commerce usage activities. The fact that mobile commerce provides ubiquity, which means that consumers can conduct transactions anytime, anywhere over wireless telecommunications networks, further boosts the number of mobile phone subscribers throughout the world.

Worldwide mobile phone users were recorded as 3 billion in 2007, more than 4 billion in 2013, and is now expected to cross 5.1 billion by 2017 (Richter, 2013). A report by the International Telecommunication Union (ITU) states that the number of mobile subscribers would reach more than 7 billion and there were as many as 3.2 billion mobile broadband subscriptions worldwide by the end of 2015 (ITU, 2015). Undeniably, mobile technology acts as a key driver for speedy information communication technology (ICT) growth in many world regions. Hence, the escalation in wireless and mobile communications worldwide has significantly changed the way individuals communicate, access, and share information (Sultan, Rohm, & Gao, 2009).

Surprisingly, the prevalence of mobile commerce markets in the Asian region has far surpassed its counterparts in the United States and Europe. China and India both account for 2.018 billion mobile subscribers out of 6.915 billion mobile subscriptions worldwide (MobiThinking, 2014). Moreover, it is reported that Asian countries such as Korea, Japan, Taiwan, and Singapore appear to be more matured in terms of their mobile commerce market compared to those of many other countries (Zhang, Zhu, & Liu, 2012).

The impact of mobile phone technologies is vast, among which are the greater than ever accessibility, frequency, and speed of communication (Balasubramanian, Peterson, & Jarvenpaa, 2002), creating new markets and opportunities, as well as changing the competitive landscape of business, existing community, and market structures (Stewart & Pavlou, 2002). This phenomenon has made consumers become more and more sophisticated in their daily life and the demand for a better mobile commerce service would increase along with their mobile commerce usage.

Nevertheless, a review of extant literature highlights that there are not much studies done in investigating the effects of individual characteristics such as personal innovativeness in the post-adoption setting (Lu, 2014). Mobile commerce users are not only technology users but also consumers. Determining how to increase their continuance intention becomes vital to mobile commerce development and to the success of mobile commerce providers (Lu, 2014). Mobile commerce users are also irregular in their actions, and they may not return to their usage activities once they leave (Lin, Wu, & Tsai, 2005). This can be seen by the fact that, some users, even though they are satisfied with their mobile commerce use, still decide to discontinue their usage activities (Hung, Hwang, & Hsieh, 2007). Therefore, it is crucial to understand the role of individual characteristics or differences that influences the behavioural adoption in a specific technology (Ratten, 2014).

Hung et al. (2007) and Chong (2013b) concur that perceived usefulness and satisfaction in the original Expectation-Confirmation Model (ECM) are inadequate for explaining the continuance intention phenomenon. Owing to that, many past researchers proclaim there is a need to add other variables in order to increase the

explanatory power of the extended ECM in the mobile commerce context (Hsiao & Chang, 2013a; 2013b; Valvi & West, 2013; Yan, Dong, Niemi, & Yu, 2013; Hung, Yang, & Hsieh, 2012). Hence, individual characteristics construct, which is dimensioned by personal innovativeness, expertise, and self-efficacy, is added in the study. This paper attempts to empirically validate the extended ECM by incorporating personal innovativeness, expertise, and self-efficacy.

2. Literature Review

2.1. Definition of Mobile Commerce

Many prominent authors and researchers in previous studies consider mobile commerce as an extension of electronic commerce and, to a certain extent, similar to electronic commerce (Chong, Chan, & Ooi, 2012; Rainer & Cegielski, 2013). The only difference is that mobile commerce transactions are wirelessly conducted with the use of mobile devices. However, Feng, Hoegler, and Stucky (2006) argue that there is much more in mobile commerce than merely an extension of electronic commerce. They claim that mobile commerce has different interactions with users, usage pattern, and value chain, thus offering business models that are not available to electronic commerce. Tiwari and Buse (2007), on the other hand, provide a clear distinction between mobile commerce and electronic commerce by viewing mobile commerce as mobile business and expanding its scope beyond monetary transactions. They define mobile commerce "as any transaction which involves the transfer of ownership or rights to use goods and services which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic mobile device" (Tiwari & Buse, 2007, p. 33). This study adopts the definition by Tiwari and Buse (2007) as they believe that mobile commerce should not be limited to monetary transactions and it should not neglect other activities such as the after sales services and sending information to customers.

2.2. Mobile Commerce Usage Activities

In order to suit the study context, the term mobile commerce used in this study is conceptualised as mobile commerce usage activities. Mahatanankoon, Wen, and Lim (2005) categorize mobile commerce usage activities as content delivery, transactions, location-based services, emergency purposes, and entertainment purposes. Apart from that, a study by Chong (2013a) divides mobile commerce activities into content delivery, transactions, location-based services, and entertainment. Content delivery deals with using a mobile device to search for and find information on the Internet whereas transactions involve using a mobile device to transfer money between consumers and businesses, while location-based services involve activities such as receiving time-sensitive discount tickets or coupons and receiving personal advertisements (Mahatanankoon et al., 2005). Lastly, entertainment involves using a mobile device for entertainment purposes such as playing games or listening to music (Chong, 2013a). This study embraces the four categories of mobile commerce usage activities empirically validated by Chong (2013a).

In Malaysia, the majority of mobile commerce usage activities' users are found to be university students. This is based on a hand phone users survey conducted by the

Malaysian Communications and Multimedia Commission (MCMC, 2015), which revealed that smartphone users are dominated by young adults from the age group of 20 to 24 years old and in terms of schooling status, 55.8% of them are university students. This specific group of population also accessed the Internet via mobile devices (MCMC, 2015). The scenario is not surprising as past studies conducted by Ooi, Sim, Yew, and Lin (2011), Sim, Tan, Wong, Ooi, and Hew (2013), Tan, Ooi, Leong, and Lin (2014), and Wong, Tan, Tan, and Ooi (2015) among university students in Malaysia found that university students are highly dependable on the network usage in their routines and thus, they are more receptive to new technology adoption such as the mobile commerce. Moreover, Sin, Nor, and Al-Agaga (2012) discovered that university students in Malaysia are actively engaged in online and mobile shopping with items purchased ranging from apparel, accessories, and travels. Furthermore, it was revealed that majority of them spend about RM51 to RM100 on apparel and accessories items via online and mobile payment (Omar, Wel, Alam, & Nazri, 2015).

2.3. Expectation-Confirmation Model (ECM)

ECM was proposed and empirically examined by Bhattacherjee (2001) in a study on American online banking users. ECM has been applied extensively to understand consumers' satisfaction and their post-purchasing behaviour by various researchers. Unlike other technology adoption models, ECM has the ability which allows a comparison of users' pre-adoption and post-adoption perceptions and their satisfaction with their current information system (IS) usage (Chong, 2013b).

Bhattacherjee posits that consumers' intention to continue their IS usage is based on three factors, which are the users' satisfaction with the IS, the extent of their confirmation, and their post-adoption behaviour which is measured by perceived usefulness (Chong, 2013b). As mobile commerce is a type of IS, many past researchers have employed the ECM in their continuance intention studies.
Based on the ECM as the baseline model, this study proposes the following hypotheses:

> *H1: Satisfaction is positively associated with continuance intention*
> *H2: Confirmation is positively associated with satisfaction*
> *H3: Confirmation is positively associated with perceived usefulness*
> *H4: Perceived usefulness is positively associated with satisfaction*
> *H5: Perceived usefulness is positively associated with continuance intention*

2.4. Individual Characteristics

Previous researches assert that individual differences among the users are key to the effective adoption of an innovation during the early stages (Agarwal & Prasad, 1999; Kwon, Choi, & Kim, 2007; Sun & Jeyaraj, 2013). Nevertheless, according to Lu (2014), compared to factors of innovation attributes such as perceived usefulness, personal characteristics are more stable and constant in various technology adoption environments, particularly during the later stage. Furthermore, social psychologists also believe that personal factors have long lasting influence on intentions and behavioural studies such as continuance usage intention (Ajzen, 2005).

The term individual characteristics is deployed by Sun and Jeyaraj (2013) in their longitudinal study of individuals' behavioural intention towards information technology adoption and continuance. In that particular study, personal innovativeness, expertise, and self-efficacy were hypothesized to influence the individuals' intention to adopt the Blackboard course management system during the early stage, which is the intention to adopt stage. Unpredictably, it is found that only personal innovativeness has a significant effect on individuals' intentions to adopt an innovation (Sun & Jeyaraj, 2013).

This study adopts individual characteristics as employed by Sun and Jeyaraj (2013) and conceptualises the construct as a second-order formative construct. The justification for operationalising individual characteristics as a formative second-order constructs is threefold (Petter, Straub, & Rai, 2007). First, according to the conceptual definition of individual characteristics, personal innovativeness, expertise, and self-efficacy should be regarded as forming their respective second-order construct rather than the other way around. Second, personal innovativeness, expertise, and self-efficacy are clearly unique, distinguishable, and not interchangeable. Third, personal innovativeness, expertise, and self-efficacy are theoretically independent as they are not highly correlated (Chiu, Hsu, Lai, & Chang, 2012).

In the current study, individual characteristics are defined as the characteristics or dispositions of the consumers considering to continue using mobile commerce activities (Sun & Jeyaraj, 2013). Unlike Sun and Jeyaraj (2013) who focus on the intention to adopt stage, this study emphasizes the effects of individual characteristics, which comprise three first-order factors namely personal innovativeness, expertise, and self-efficacy, on satisfaction and the continuance intention stage.

Personal Innovativeness - This study defines personal innovativeness as the degree to which a consumer is willing to try out any new information technology (Agarwal & Prasad, 1998; Rogers, 2003). Personal innovativeness is regarded as a stable situation-specific individual difference that impacts how individuals perceive and use information technology (Thatcher & Perrewé, 2002; Chou & Chen, 2009). A positive association between personal innovativeness and satisfaction is found in studies by Chou and Chen (2009) and Hung et al. (2007). Earlier studies that establish a direct and significant association between personal innovativeness and continuance intention were conducted by Lin and Filieri (2015), Lu (2014), and Hung et al. (2007). Lu (2014) discovers that user personal innovativeness is among the primary determinants of mobile commerce continuance intention among American university students. Therefore, it is hypothesized that:

> H6: Consumers' individual characteristics towards mobile commerce are positively associated with satisfaction.
> H6a: Personal innovativeness is positively associated with satisfaction.
> H7: Consumers' individual characteristics towards mobile commerce are positively associated with continuance intention in mobile commerce usage activities.
> H7a: Personal innovativeness is positively associated with continuance intention in mobile commerce usage activities.

Expertise - According to Igbaria, Guimaraes, and Davis (1995), expertise refers to an individual's skills and abilities that enable him or her to adopt innovations with relative ease. In this study, expertise denotes a consumer's skills and abilities that enable him or her to adopt mobile commerce with relative ease. Expertise is regarded

as a dynamic individual difference that impacts how individuals perceive and use information technology due to the fact that it may diminish or increase the influence on behavior over time (Thatcher & Perrewé, 2002).

A review of literature provides mixed findings on the relationship between expertise and continuance intention. A local study conducted by Ramayah, Ling, Taghizadeh, and Rahman (2016) found that employee's expertise has no significant effect on SMEs' website continuance adoption intention. In contrast, customers' expertise influences continuance intention in mobile data service among university students in Southwestern, United States of America (Boakye, 2015). On top of that, Chen and Lin (2015) verify a positive relationship between customers' expertise and satisfaction towards sustainable social relationship in blogs. Therefore, it is hypothesized that:

> H6b: Expertise is positively associated with satisfaction.
> H7b: Expertise is positively associated with continuance intention in mobile commerce usage activities.

Self-efficacy - In the present study, self-efficacy refers to the judgment of a consumer's capability to use mobile commerce activities (Compeau & Higgins, 1995). It is regarded as a dynamic situation-specific individual difference that impacts how individuals perceive and use information technology (Thatcher & Perrewé, 2002; Chou & Chen, 2009). Chou and Chen (2009) claim that satisfaction with information system use is predicted primarily by users' general computer self-efficacy and secondarily by their personal innovativeness in information technology. Moreover, Bhattacherjee, Perols, and Sanford (2008) confirm a significant effect of self-efficacy towards continuance intention of document management system. Meanwhile, in a study by Mäntymäki, Merikivi, Verhagen, Feldberg, and Rajala (2014) on the determinants of continued intention to use virtual worlds amongst teenagers, it was discovered that users' self-efficacy acts as the key element of continued user engagement in virtual worlds. Hence, it is hypothesized that:

> H6c: Self-efficacy is positively associated with satisfaction.
> H7c: Self-efficacy is positively associated with continuance intention in mobile commerce usage activities.

3. Methodology

Subjects of this research were individuals who used mobile commerce activities as discussed in the Literature Review. Questionnaires were administered to undergraduate and postgraduate students from six public universities in Malaysia. In this study, disproportionate stratified random sampling was utilized based on the respondents' current study programs, namely Diploma, Bachelor's Degree, Master, and PhD. It is the most suitable sampling technique when some strata are too small or too large, such as tertiary study programs (Sekaran & Bougie, 2013). All respondents had prior experience with mobile commerce usage activities. A total of 800 surveys were distributed for the study. Incomplete surveys were discarded, leaving only 632 usable samples. The overall response rate for this study is 79%. Of the 632 respondents, 587 were undergraduate students while 45 were postgraduate students. There were 476 females and 156 male respondents.

3.1. Measurement Items

Seven constructs were measured in this research: perceived usefulness, personal innovativeness, expertise, self-efficacy, confirmation, satisfaction, and continuance intention. The measurement items were adopted from different sources to suit the study. Items for continuance intention were adapted from Bhattacherjee (2001), Lee (2010), and Chong (2013b), whereas confirmation were adapted from Bhattacherjee (2001), Bhattacherjee et al. (2008), and Chong (2013b). Measurement items for satisfaction were adapted from Bhattacherjee (2001) and Chong (2013b), whilst items for perceived usefulness were adapted from Pedersen (2005) and Chong (2013b). Items for personal innovativeness were adapted from Agarwal and Prasad (1998), whereas items for expertise were from Sun and Jeyaraj (2013). Finally, items for self-efficacy were adapted from Khalil and Pearson (2008) and Mäntymäki, Merikivi, Verhagen, Feldberg, and Rajala (2014). All items were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

4. Results

4.1. Assessment of the Measurement Model

Partial least squares structural equation modelling (PLS-SEM), a variance based structural equation modelling (SEM), was employed to analyze the hypotheses generated. This technique was chosen as this study is categorized as prediction-oriented modelling. Hair, Hult, Ringle, and Sarstedt (2014) assert that PLS-SEM is the most appropriate approach if the researcher focuses on predictive and/or development of the theory (Lowry & Gaskin, 2014). The two-step analytical procedure suggested by Anderson and Gerbing (1988) was adopted to analyze data whereby the measurement model was evaluated first followed by the structural model. The measurement model was analyzed by using confirmatory factor analysis (CFA) in order to assess the goodness of measure. According to Hair et al. (2014), the two major criteria used for evaluating goodness of measure are reliability and validity. In measuring the reliability, the main criterion is to evaluate the internal consistency reliability. This can be done by assessing the composite reliability (CR) values for each construct. As for the validity measurement, construct validity of a proposed measurement theory needs to be assessed before proceeding with further analysis. Construct validity is made up of two important components: convergent validity and discriminant validity (Hair, Black, Babin, & Anderson, 2010). Both of the components need to be analyzed. Convergent validity is the extent to which indicators of a specific construct converge or share a high proportion of variance in common (Hair et al., 2010). In order to ascertain convergent validity, the outer loadings of the indicators in addition to the average variance extracted (AVE) should be considered (Hair et al., 2014). Hair et al. (2010) assert that factor loadings and AVE of more than 0.50 and CR value of 0.70 or above are deemed to be acceptable.

The measurement model yielded results as displayed in Table 1; all loadings and AVE are above 0.50 and the CR values are more than 0.70. Therefore, it can be concluded that the measurement in this study is reliable and the convergent validity has been established.

After that, the discriminant validity was assessed. Discriminant validity is the extent to which a construct is truly distinct from the other constructs (Hair et al., 2010). This can be established by the low correlations between all the measure of interest and the measure of other constructs. To address discriminant validity, the square root of the AVE is compared against the correlations of the other constructs. Table 2 displays that discriminant validity has been established since the AVE extracted is greater than its correlations with all the other constructs (Fornell & Larcker, 1981).

Table 1. Results of the measurement model

Construct	Item	Composite Reliability	Convergent Validity	
			Factor Loading	AVE
Perceived Usefulness	BPU1	0.905	0.776	0.615
	BPU2		0.795	
	BPU3		0.785	
	BPU4		0.819	
	BPU5		0.794	
	BPU6		0.733	
Personal Innovativeness	BPINN1	0.872	0.847	0.694
	BPINN2		0.806	
	BPINN3		0.844	
Self-efficacy	BSE1	0.897	0.800	0.634
	BSE2		0.824	
	BSE3		0.747	
	BSE4		0.810	
	BSE5		0.798	
Expertise	BEXP1	0.881	0.812	0.651
	BEXP2		0.846	
	BEXP3		0.788	
	BEXP4		0.781	
Confirmation	BCONF1	0.858	0.812	0.602
	BCONF2		0.793	
	BCONF3		0.795	
	BCONF4		0.698	
Satisfaction	BSAT1	0.913	0.846	0.678
	BSAT2		0.832	
	BSAT3		0.888	
	BSAT4		0.854	
	BSAT5		0.684	
Continuance Intention	BCONT1	0.876	0.784	0.640
	BCONT2		0.861	
	BCONT3		0.857	
	BCONT4		0.686	

4.2. Assessment of Structural Model

The structural model represents the relationship between constructs or latent variables that were hypothesized in the research model. Correspondingly, following the suggestion of Hair et al. (2014), the bootstrapping method (5,000 subsamples) was done to determine the significant level of loadings, weights, and path coefficients. Table 3 demonstrates the results of the structural model from the PLS output. Satisfaction was found to be significantly related to continuance intention ($\beta = 0.285$, p<0.01), thus supporting H1. Confirmation was found to be significantly related to satisfaction ($\beta = 0.336$, p<0.01) and perceived usefulness ($\beta = 0.512$, p<0.01), thus supporting H2 and H3 of this study. Perceived usefulness was found to be significantly

related to satisfaction (β = 0.209, p<0.01) and continuance intention (β = 0.211, p<0.01), hence supporting H4 and H5. As expected, the results clearly show that individual characteristics construct is positively and significantly associated with satisfaction (β = 0.166, p<0.01) and continuance intention (β = 0.225, p<0.01), thus supporting H6 and H7. In addition, the total effects result of all individual characteristics' factors (H6a, H6b, H6c, H7a, H7b, and H7c) also provides an evidence that positively and significantly supports the hypotheses testing.

Table 2. Discriminant validity of constructs

Construct	Confirmation	Continuance Intention	Expertise	Personal Innovativeness	Perceived Usefulness	Satisfaction	Self-efficacy
Confirmation	0.776						
Continuance Intention	0.496	0.800					
Expertise	0.521	0.405	0.807				
Personal Innovativeness	0.363	0.282	0.480	0.833			
Perceived Usefulness	0.512	0.443	0.432	0.277	0.784		
Satisfaction	0.540	0.484	0.429	0.255	0.456	0.824	
Self-efficacy	0.531	0.405	0.685	0.405	0.393	0.411	0.796

Note: Diagonal represents the square root of AVE while the other entries represent the squared correlations

Table 3: Summary of the structural model

Path		Coefficient	*t* value	Results
Satisfaction → Continuance Intention	H_1	0.285	6.801	Supported
Confirmation → Satisfaction	H_2	0.336	7.141	Supported
Confirmation → Perceived Usefulness	H_3	0.512	16.352	Supported
Perceived Usefulness → Satisfaction	H_4	0.209	5.315	Supported
Perceived Usefulness → Continuance Intention	H_5	0.211	5.418	Supported
Individual Characteristics → Satisfaction	H_6	0.166	3.673	Supported
Personal Innovativeness → Satisfaction	H_{6a}	0.039	3.625	Supported
Expertise → Satisfaction	H_{6b}	0.070	3.656	Supported
Self-efficacy → Satisfaction	H_{6c}	0.086	3.655	Supported
Individual Characteristics → Continuance Intention	H_7	0.225	5.915	Supported
Personal Innovativeness → Continuance Intention	H_{7a}	0.064	6.517	Supported
Expertise → Continuance Intention	H_{7b}	0.115	7.173	Supported
Self-efficacy → Continuance Intention	H_{7c}	0.141	7.066	Supported

The goodness of the structural model is established by the variance explained (R^2) and the predictive relevance of the endogenous constructs (Q^2) (Hair et al., 2014). The R^2 value is a measure of the model's predictive accuracy and is calculated as the squared correlation between a specific endogenous construct's actual and predicted values (Hair et al., 2014). Referring to Table 4, the final endogenous construct, continuance intention, has an R^2 of 0.333, suggesting that 33.3% of the variance in extent of continuance intention can be explained by satisfaction, individual characteristics, and perceived usefulness. The R^2 values can be reflected as high since R^2 values of more than 0.20 are considered high in consumer behaviour discipline (Hair et al., 2014). A closer look at the findings of the study also reveals that satisfaction is the strongest predictor of continuance usage intention, followed by individual characteristics and

perceived usefulness, respectively. On the other hand, confirmation is the strongest predictor of satisfaction, followed by perceived usefulness, and individual characteristics, appropriately.

Apart from assessing the magnitude of the R^2 value, Hair et al. (2014) also suggest that the Stone-Geisser's Q^2 value (Geisser, 1974; Stone, 1974) is examined as a criterion of predictive accuracy. The Q^2 value is a measure of predictive relevance that represents how well the observed values are reproduced by the model and its estimating parameters (Hair et al., 2014). A Q^2 value larger than zero for a certain reflective endogenous construct specifies the path model's predictive relevance for that particular construct (Hair et al., 2014).

In analyzing the predictive relevance, the blindfolding procedure was carried out using omission distance D = 7 as recommended by Hair, Sarstedt, Ringle, and Mena (2012), who indicate that the omission distance value of between 5 and 10 is feasible in most applications. The calculation of Q^2 values are based on the cross-validated redundancy approach that fits the PLS-SEM analysis perfectly (Hair et al., 2014). The results are presented in Table 4. As can be seen, all Q^2 values are considerably above zero; thus, providing support that the model in this study has predictive relevance for all its endogenous constructs.

Table 4: Variance explained and predictive relevance

Endogenous Construct	Variance Explained (R^2)	Predictive Relevance (Q^2)
Perceived Usefulness	0.263	0.159
Satisfaction	0.352	0.231
Continuance Intention	0.333	0.207

5. Discussion and Conclusion

The purpose of this study was to test the extended ECM among Malaysian mobile commerce consumers by integrating it with the individual characteristics construct, which consists of first-order factors such as personal innovativeness, expertise, and self-efficacy. The study also examined the relationships among confirmation, perceived usefulness, and satisfaction and the impact of perceived usefulness and satisfaction on continuance intention of mobile commerce usage activities.

Individual Characteristics, Satisfaction, and Continuance Intention - The findings in this study discovered that individual characteristics ($\beta = 0.166$, p<0.01) significantly influence satisfaction in mobile commerce usage activities. Amongst the three constructs, self-efficacy (0.086) has the strongest total effect on satisfaction, followed by expertise (0.070) and personal innovativeness (0.039). This result is similar to the not-so-many earlier studies that established a positive association between personal innovativeness and satisfaction such as Chou and Chen (2009) and Hung et al. (2007). Analogous to the findings of this study, Chou and Chen (2009) claim that satisfaction with information system use was predicted primarily by users' general computer self-efficacy and secondarily by their personal innovativeness in information technology. The larger regression coefficient value (β) of self-efficacy derived in this study, relative to expertise and personal innovativeness, suggests that consumers view their capability to use mobile commerce in diverse situations as being more salient than

their expertise and innovativeness in forming satisfaction towards mobile commerce usage activities. The result of this study also reveals that the individual characteristics construct is the third rank predictor in determining consumers' satisfaction in mobile commerce usage activities. This result is similar to the study conducted by Hung et al. (2007), which indicated personal innovativeness as the third determinant of satisfaction. This rather weak influence of individual characteristics on consumers' satisfaction infers that in developing their level of satisfaction, consumers' capability, expertise, and innovativeness play their roles only after their expectations and beliefs are achieved.

As expected, the findings in this study found that individual characteristics (β = 0.225, p<0.01) significantly influence continuance intention in mobile commerce usage activities. Amongst the three constructs, self-efficacy (0.141) has the strongest total effect on continuance intention, followed by expertise (0.115) and personal innovativeness (0.064). This result is comparable to the earlier studies that established a direct and significant association between personal innovativeness and continuance intention such as Lin and Filieri (2015), Lu (2014), and Hung et al. (2007) as well as between personal innovativeness and intention to adopt such as Sun and Jeyaraj (2013) and Agarwal and Prasad (1998). Additionally, Bhattacherjee et al. (2008) validate a significant effect of self-efficacy towards continuance intention of document management system. Meanwhile, customers' expertise influences continuance intention in mobile data service among university students in Southwestern, United States of America (Boakye, 2015). The larger regression coefficient value (β) of self-efficacy derived in this study, relative to expertise and personal innovativeness, suggests that consumers view their capability to use mobile commerce in diverse situations as being more important than their expertise and innovativeness in forming their intention to continue using mobile commerce activities. The result of this study also reveals that individual characteristics construct is secondary to satisfaction in explaining continuance intention. In other words, consumers continue using mobile commerce activities, for the most part, because they are satisfied. This is akin to many past studies such as Oghuma, Libaque-Saenz, Wong, and Chang (2016), Chen and Lin (2015), and Bhattacherjee (2001).

Perceived Usefulness, Satisfaction, and Continuance Intention - Unsurprisingly, perceived usefulness is significantly and positively associated with satisfaction (β = 0.209, p<0.01) and continuance intention (β = 0.211, p<0.01). The result of this study is in line with previous studies that certified the significance path between perceived usefulness, satisfaction, and continuance intention (Oghuma et al., 2016; Oghuma, Chang, Libaque-Saenz, Park, & Rho, 2015; Bhattacherjee, 2001). The result of this study also reveals perceived usefulness is secondary to confirmation in determining satisfaction. This result confirms many of the findings of the earlier studies (Oghuma et al., 2016; Samar Mouakket, 2015; Bhattacherjee, 2001). This weaker influence of perceived usefulness on user satisfaction can be interpreted that Malaysian consumers view the realization of their expectation as more important than the perceived usefulness of mobile commerce usage activities in forming their level of satisfaction.

Confirmation, Perceived Usefulness, and Satisfaction - Based on the results, confirmation is significantly and positively associated with perceived usefulness (β = 0.512, p<0.01) and satisfaction (β = 0.336, p<0.01). The significant results are congruent with mainstream prior empirical studies, for example Oghuma et al. (2016),

Oghuma et al. (2015), and Bhattacherjee (2001). In addition, confirmation was found to be the strongest predictor of consumers' satisfaction. This strongly indicates that the fulfilment of consumers' expectation on the performance of mobile commerce usage activities is much more important to their satisfaction which may indirectly affect the continuance usage of mobile commerce activities. This is proven by previous studies on mobile commerce in China and Taiwan which declare that confirming the expectation of the users will influence their satisfaction which will further boost the possibility of them to continuously use mobile commerce (Chong, 2013b; Hung et al., 2007).

Regardless of the useful findings of this study, there are several limitations that need to be acknowledged. First, there is a possibility that additional adoption factors have not been included in this study. Second, the findings cannot be generalized extensively in Malaysia as the scope of the study is only limited to university students. As such, caution needs to be taken when generalizing to the population of the whole country. For that reason, this research can be improved further in the future by incorporating other relevant variables based on the latest literature suggestions and collecting data from general mobile commerce users.

Theoretically, this study adds to the growing body of literature that focuses on the post-adoption environment, which is continuance intention. It also contributes to the evidence in support for the determinants of continuance intention in mobile commerce usage activities especially in the Malaysian context by taking into account individual characteristics construct which consists of first-order factors namely personal innovativeness, expertise, and self-efficacy. Practically, since satisfaction was found to have a strong strength of association with continuance intention as compared to individual characteristics, mobile commerce operators and mobile application developers need to recognize the various drivers and possible challenges to increase the level of satisfaction and continuance among mobile commerce users. Issues such as connectivity, connection speed, privacy, security, and confidentiality of the data transmitted wirelessly can bring a great sense of satisfaction to the consumers to continuously use mobile commerce. Any dissatisfaction that arises in terms of the abovementioned issues may have an impact on the continuance intention, which may affect the survival and sustainability of mobile commerce industry.

Undoubtedly, based on the findings, individual characteristics construct plays an important role in this study and it does matter when dealing with the continuance intention of mobile commerce usage activities. As a result, this study successfully extends the theoretical contribution of the original ECM. Therefore, mobile commerce application developers and providers should also take consumers' individual characteristics into consideration due to the fact that consumers' satisfaction dynamically changes with their individual characteristics even though they are satisfied with the post-mobile commerce approach they are using at present (Hung et al., 2007). Acquisition of a better understanding of consumers' dynamic individual differences such as self-efficacy and expertise along with stable individual differences such as personal innovativeness, would be valuable and beneficial for the providers of mobile commerce in constructing effective marketing strategies to promote continued use among the consumers (Chou & Chen, 2009; Hung et al., 2007).

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